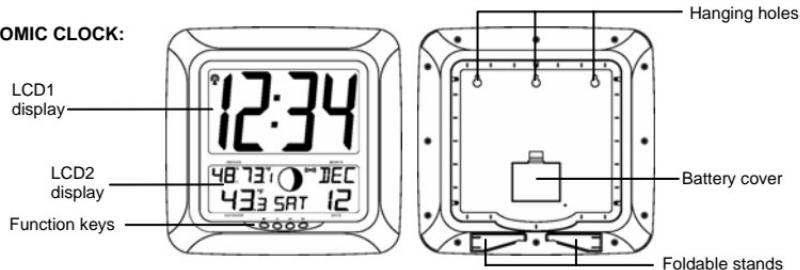


WS-8248U
**ATOMIC CLOCK WITH INDOOR TEMP/HUMIDITY AND OUTDOOR
TEMPERATURE**

Instruction Manual

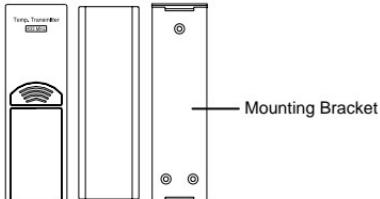
FEATURES:

ATOMIC CLOCK:



- WWVB Radio controlled time with manual time setting
- Time display: hour, minute, second
- Alarm setting with snooze function
- Complete calendar display
- Weekday display (3 languages to choose from: English, French and Spanish)
- Time zone setting
- Daylight savings time ON/OFF option (DST)
- °F or °C temperature display selectable
- Indoor temperature and humidity display
- Outdoor temperature display via 433MHz transmission
- Wall mount or freestanding
- Current moon phase display

OUTDOOR TEMPERATURE TRANSMITTER:



- Remote transmission of outdoor temperature to the atomic clock by 433 MHz signals
- Wall mounting case

TO INSTALL AND REPLACE BATTERIES IN THE TEMPERATURE TRANSMITTER

The transmitter uses 2 x AA, 1.5V batteries. To install and replace the batteries, please follow the steps below:

1. Remove the cover.
2. Insert the batteries, observing the correct polarity (see marking inside battery compartment).
3. Replace the battery cover on the unit.

Alkaline batteries are recommended for use in both units. Avoid using rechargeable batteries.

TO INSTALL AND REPLACE BATTERIES IN THE ATOMIC CLOCK

The atomic clock uses 3 x AA, 1.5V batteries. To install and replace the batteries, please follow the steps below:

1. Pull down on the tab at the top of the battery cover and lift up to remove the cover.
2. Insert batteries observing the correct polarity (see marking inside battery compartment).
3. Replace compartment cover.

DO NOT SET THE CLOCK.

SETTING UP:

Alkaline batteries are recommended for use in both units. Avoid using rechargeable batteries.

NOTE: Do not set the clock until the outdoor temperature is displayed.

1. Place batteries in the outdoor transmitter first, then into the atomic clock. **DO NOT PRESS ANY BUTTONS FOR 15 MINUTES.**

- After 15 minutes both the Indoor and Outdoor areas on your clock should have a temperature showing. If not, remove both sets of batteries, wait 15 minutes and repeat step one.
- After the clock receives the outdoor temperature the WWVB time code reception will automatically start. This reception typically takes between 5-10 minutes in good conditions. If after 15 minutes the WWVB time has not been received, use the "SET" key to manually enter the set-up mode and change either the time or date in order to activate the WWVB reception (see manual settings below). The clock will then automatically attempt to receive the WWVB time from 12:00 am through 6:00 am each day (attempts WWVB reception every full hour within this time frame). When this is successful, the received time will override the manually set time. The date is also updated with the received time (Please refer to notes on "**Radio controlled time**" and "**Manual time setting**").
- After the time signal has been received or the search mode has been manually stopped the indoor temperature will be displayed.

Note:

When changing batteries in either of the units, ensure that the batteries do not spring free from the contacts. Always wait at least 15 minutes after removing the batteries before reinserting, otherwise start up and transmission problems may occur.

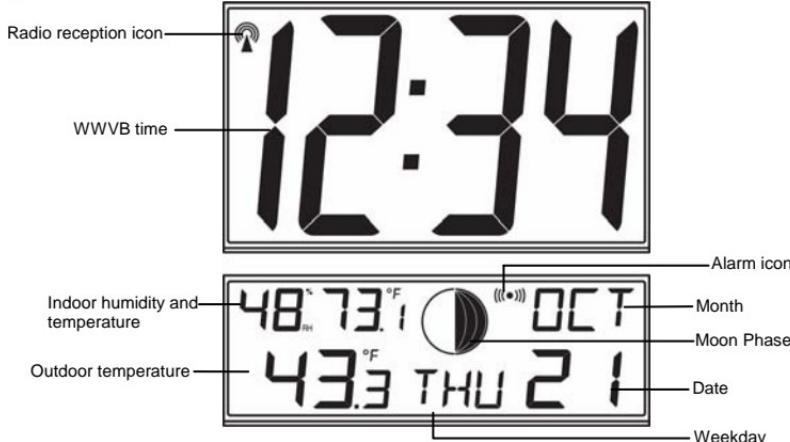
FUNCTION KEYS

The atomic clock has four easy to use keys:

- SET** key : To enter into the set mode for the following functions: LCD contrast, time zone, DST ON/OFF (daylight saving time), radio-controlled time ON/OFF, language, hour, minute, year, month and date.
- + key** : To toggle between the seconds display options
To change any values in manual set mode
- ALM** key : To enter into the alarm set mode
To set the alarm ON/OFF
To display the alarm time in normal mode display
To exit the setting modes
- SNZ** key : To activate the snooze function during alarm

ATOMIC CLOCK LCD SCREEN DESCRIPTIONS

The atomic clock's LCD is divided into 2 sections and once the batteries are inserted, all the segments will light up briefly before displaying the information for time, date, indoor and outdoor temperatures and indoor humidity.



MANUAL SETTINGS

Note:

If the atomic clock has already successfully received the WWVB time signal and displays the correct time and date, then the Manual settings can be skipped.

After completion of the above described procedures in "Setting up" the manual setting modes can be entered by pressing and holding the **SET** key for 5 seconds. The following settings can now be programmed:

- LCD contrast setting

Default (Factory) Setting

• Time zone setting	-5 (Eastern Standard Time)
• DST ON/OFF	ON
• Radio-controlled time ON/OFF	ON
• Language display setting	ENG (English)
• Manual time setting (Hour then Minute)	12 (hour), 00 (minute)
• Year setting	2004
• Month setting	Jan (January)
• Date setting	1

LCD CONTRAST SETTING

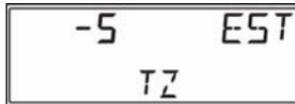
After entering the manual setting mode as described above, the LCD contrast can be set between 0 and 7.



1. Press and hold the **SET** key for 5 seconds.
2. LCD will be displayed in the lower display and a number will flash to the right of the word LCD.
3. Press and release the **+** key to select the desired LCD contrast.
4. Press and release the **SET** key to confirm the LCD contrast and continue to the Time Zone setting.

TIME ZONE SETTING

The time zone can be set between the -1 to -12 hour or Greenwich Mean Time (GMT) range.



1. The time zone will start flashing (Default setting "-5h") in the lower LCD display.
2. Press and release the **+** key to select the desired time zone.
3. Press and release the **SET** key to confirm the time zone setting and continue to the DST (Daylight Saving Time) setting.

Note: The time zones from -4 to -10 hours will be displayed with 3 characters abbreviations:

- -4 ATL (Atlantic time),
- -5 EST (Eastern time; default time zone),
- -6 CST (Central time),
- -7 MST (Mountain time),
- -8 PST (Pacific time),
- -9 ALA (Alaska time),
- -10 HAW (Hawaii time).
- "GMT" will be displayed if set to GMT (0).

DST SETTING (DAYLIGHT SAVING TIME)



1. The word ON will start flashing in the lower LCD display.
2. Press and release the + key to select DST ON or OFF.
3. Press and release the **SET** key to confirm the DST setting and continue to the Radio-controlled time setting.

Note: The DST default is "ON", meaning that the WWVB will automatically change the time according to Daylight Saving Time in the spring and fall. For areas that do not recognize DST changes (Arizona and parts of Indiana) turn the DST "OFF".

RADIO-CONTROLLED TIME SETTING



1. The word ON will start flashing in the lower LCD display.
2. Press and release the + key to select radio-controlled time ON or OFF.
3. Press and release the **SET** key to confirm the radio-controlled time setting and continue to the Language setting.

Note: Turn off the radio-controlled time feature only if you DO NOT want the clock to automatically update itself.

LANGUAGE SETTING

The weekdays can be displayed in LCD2 with the pre-set languages: US English (ENG), French (FRA) and Spanish (ESP).



1. LAN will be displayed in the lower LCD along with one of the three letter language abbreviations.
2. Press and release the + key to select the desired language.
3. Press and release the **SET** key to confirm the language setting and enter the Manual Time setting mode.

MANUAL TIME SETTING

In case the atomic clock is not able to detect the WWVB-signal (disturbances, transmitting distance, etc.), the time can be manually set. The clock will then work as a normal Quartz clock.

Note: In 12-hour mode the time will be displayed with an additional "PM" for the time from 12:00 noon until 11:59.

1. The hour digits will start flashing in the upper LCD.
2. Select the desired hours by pressing and releasing the + key.
3. Press and release the **SET** key to advance to the minutes setting.
4. Now the minute digits will start flashing.
5. Select the desired minutes by pressing and releasing the + key. If the + key is held, the units will increase by 5.
6. Press and release the **SET** key to confirm the Time setting and continue to the Year setting.

Note:

The unit will still try to receive the signal every day despite it being manually set. When it does receive the signal, it will change the manually set time into the received time. During reception attempts the WWVB tower icon will flash. If reception has been unsuccessful, then the WWVB tower icon will not appear but reception will still be attempted the following hour.

WWVB time reception takes place from 12:00 am through 6:00 am each day (attempts WWVB reception every full hour within this time frame). When the time signal is received for example at 1:00 am, the atomic clock will not attempt to receive the WWVB signal for the remaining hours until 6:00 am. Therefore, the next signal attempt will take place between 12:00 am and 6:00 am the next day. The other times WWVB reception takes place, are upon setup and after manual time set exiting mode. Reception is generally not possible during daylight hours due to the interference of the sun.

YEAR SETTING

The year can be selected sequentially from 2003 to 2029 and will then start over again (default setting 2004). None of the digits of the year will be visible on the lower LCD display however the year must be correct as it affects the day of the week display.

1. The year digits will start flashing in the lower LCD.
2. Press and release the **+** key to select the desired year.
3. Press and release the **SET** key to confirm the Year setting and continue to the Month setting.

MONTH SETTING

1. The month digits on LCD2 will start flashing.
2. Press and release the **+** key to select the desired month.
3. Press and release the **SET** key to confirm the Month setting and continue to the Date setting.

DATE SETTING

1. The digits for the date will start flashing in the lower LCD (Default setting 1).
2. Press and release the **+** key to select the desired date.
3. Press and release the **SET** key to confirm the Date setting and exit the manual setting mode.

Note: The date can only be set in conjunction with the selected month. For example, it is not possible to set the date 30 if the month of February is selected.

EXIT THE MANUAL SETTING MODES

- To return to the normal display mode from anywhere in manual setting mode simply press the **ALM** key at anytime.
- If no keys are pressed for at least 15 seconds in setting mode, the atomic clock will automatically switch back to normal display mode.

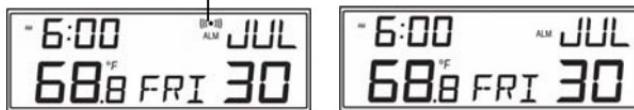
ALARM SETTING

To enter into the alarm setting mode:

1. Hold the **ALM** key for 5 seconds. The hour digits start flashing.
2. Press and release the + key to set the hour.
3. Press and release the **ALM** key to continue to the minutessetting.
4. The minute digits start flashing.
5. Press and release the + key to set the minutes.
6. Press and release the **ALM** key to exit the Alarm setting mode or wait for 15 seconds for the clock to automatically timeout and return to the standard display mode.

TO DEACTIVATE THE ALARM:

Alarm icon ((*)) (ON)



The alarm will be automatically switched ON when the alarm time is set. To deactivate the alarm (OFF), press and release once the **ALM** key in normal mode display. The alarm icon will disappear, the alarm is now off.

SNOOZE SETTING

The snooze can only be activated during alarm time for a snooze duration of 10 minutes by pressing the **SNZ** key on the back of the clock.

OUTDOOR TEMPERATURE TRANSMITTER:

The temperature is measured and transmitted to the atomic clock every 1 minute. The atomic clock will update the temperature display every 5 minutes.

The range of the outdoor temperature transmitter may be affected by the temperature. At cold temperatures the transmitting distance may be decreased. Please bear this in mind when positioning the transmitter. Also the batteries may be reduced in power during periods of extreme cold temperatures.

433MHz RECEPTION CHECK FOR OUTDOOR TEMPERATURE TRANSMITTER

The atomic clock will receive the temperature data within 4 minutes. If the temperature data has not been received 4 minutes after setting up (the display shows “---”), then please check the following points:

1. The distance of the atomic clock or outdoor temperature transmitter should be at least 6 feet (2 meters) away from any interfering sources such as computer monitors or TV sets.
2. Avoid placing the receiver onto or in the immediate proximity of metal window frames.
3. Using other electrical products such as headphones or speakers operating on the same signal frequency (433MHz) may prevent correct signal transmission and reception.
4. Neighbors using electrical devices operating on the 433MHz signal frequency can also cause interference.

Note:

When the 433 MHz signal is received correctly, do not re-open the battery cover of either the outdoor temperature transmitter or atomic clock, as the batteries may spring free from the contacts and force a false reset. Should this happen accidentally then reset all units (see **Setting up** above) otherwise transmission problems may occur.

The maximum transmission range is 330 feet (100 meters) from the outdoor temperature transmitter to the atomic clock (in open space). However, this depends on the surrounding environment and interference levels. If no reception is possible despite the observation of these factors, all system units have to be reset (see **Setting up**).

CHANGING THE DISPLAY MODE (SECONDS,TEMPERATURES AND HUMIDITY)

There are four possible display modes to view the seconds, temperatures and humidity.

The *indoor humidity, indoor temperature and outdoor temperature display* is the default (factory) setting.



To change the display:

1. Press and release the + key. The display should now show the seconds, *indoor temperature and outdoor temperature*.



2. Press and release the + key a second time. The display will now show the *indoor humidity, seconds and outdoor temperature*.



3. Press and release the + key a third time. The display will now show the indoor humidity, indoor temperature and seconds.



4. Press and release the + key a fourth time. The display will now return to the normal display mode, *indoor humidity, indoor temperature and outdoor temperature*.



WWVB RADIO CONTROLLED TIME

The NIST radio station, WWVB, is located in Ft. Collins, Colorado and transmits the exact time signal continuously throughout the United States at 60 kHz. The signal can be received up to 2,000 miles away through the internal antenna in the atomic clock. However, due to the nature of the Earth's Ionosphere, reception is very limited during daylight hours. The atomic clock will search for a signal every night when reception is best. The WWVB radio station derives its signal from the NIST atomic clock in Boulder, Colorado. A team of atomic physicists continually measures every second of every day to an accuracy of ten billionths of a second a day. These physicists have created an international standard, measuring a second as 9,192,631,770 vibrations of a Cesium 133 atom in a vacuum. This atomic clock regulates the WWVB transmitter.

Once the outdoor temperature is displayed on the atomic clock, the WWVB tower icon in the clock display will start flashing in the top center of the LCD. This indicates that the clock has detected a radio signal and is trying to receive it. When the time code is received, the WWVB tower becomes permanently lit and the time will be displayed.

If the tower icon flashes, but does not set the time or the WWVB tower does not appear at all, then please take note of the following:

- Recommended distance to any interfering sources like computer monitors or TV sets is a minimum of 6 feet (2 meters).
- Within ferro-concrete rooms (basements, superstructures), the received signal is naturally weakened. In extreme cases, please place the unit close to a window and/or point its front or back towards the Fort Collins, Colorado, transmitter.
- During nighttime, the atmospheric disturbances are usually less severe and reception is possible in most cases. A single daily reception is adequate to keep the accuracy deviation below 1 second.

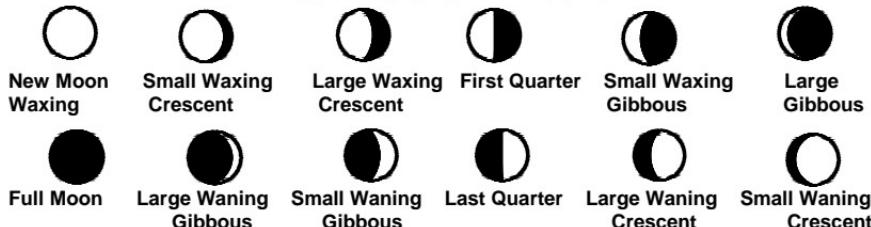
Note:

In case the atomic clock is not able to detect the WWVB-signal (disturbances, transmitting distance, etc.), the time can be manually set (please refer to notes on **Manual time setting**).

MOON PHASE

The moon phases appear in the middle of the lower LCD. There are 12 visible Moon Phases that will show in the LCD:

MOON PHASES FOR THE WS-8248



POSITIONING

Before permanently mounting ensure that the atomic clock is able to receive WWVB signals from the desired location. Also, extreme and sudden changes in temperature will decrease the accuracy of the atomic clock, and changes in elevation will result with inaccurate temperatures

readings for the next 12 to 24 hours. These changes will require a 12 to 24 hour wait before obtaining reliable data.

To achieve a true temperature reading, avoid mounting where direct sunlight can reach the outdoor temperature transmitter. It is recommended to mount the outdoor temperature transmitter on a North-facing wall or in any well shaded area. The maximum transmitting range is 330 feet (100 meters). Obstacles such as walls, concrete, and large metal objects can reduce the range.

Place both units in their desired location, and wait approximately 10 minutes before permanently mounting to ensure that there is proper reception. The outdoor temperature transmitter is not waterproof and should not be placed anywhere it will become submerged in water or be directly in the rain.

POSITIONING THE ATOMIC CLOCK:

There are two possible ways to mount the atomic clock:

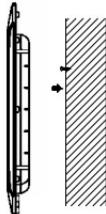
- use of the foldout table stands, or
- wall mounting

FOLDOUT TABLE STAND



The foldout table stand legs are located on the backside, at the lower corners, just below the battery cover. The hinges are towards the edges of the atomic clock, and the ends (with no hinge) need to be folded out towards the edge. Once the foldout table stands are extended, place the atomic clock in an appropriate location.

WALL MOUNTING



- 1) Using a straight edge, horizontally space at 2-3/4 of an inch (70 mm) three screw positions on a wall.
- 2) Install three mounting screws (not included) into a wall —leaving approximately 3/16 of an inch (5mm) extended from the wall.
- 3) Place the atomic clock onto the screws, using the hanging holes on the backside. Gently pull the atomic clock down to lock the screws into place.

Note:

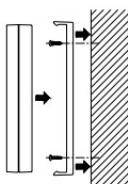
Always ensure that the atomic clock locks onto the screws before releasing.

POSITIONING THE OUTDOOR TEMPERATURE TRANSMITTER

The outdoor temperature transmitter can be mounted in two ways:

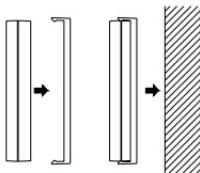
- with the use of screws
- using the adhesive tape.

MOUNTING WITH SCREWS



- 1) Remove the mounting bracket from the outdoor temperature transmitter.
- 2) Place the mounting bracket over the desired location. Through the three screw holes of the bracket, mark the mounting surface with a pencil.
- 3) Where marked, start the screw holes into mounting surface.
- 4) Screw mounting bracket onto the mounting surface. Ensure that the screws are flush with the bracket.

MOUNTING WITH ADHESIVE TAPE



- 1) With a nonabrasive solution, clean and dry the back of the mounting bracket and the mounting surface to ensure a secure hold. The mounting surface should be smooth and flat.
- 2) Remove the protective strip from one side of the tape. Adhere the tape to the designated area on the back of the mounting bracket.

- 3) Remove the protective strip from the other side of the tape. Position the outdoor temperature transmitter in the desired location, ensuring that the atomic clock can receive the signal.

TROUBLESHOOTING

Problem:	The LCD is faint.
Solution:	1) Replace the batteries.
Problem:	No reception of WWVB signal
Solution:	<ol style="list-style-type: none"> 1) It may help reception to face the front of the atomic clock in the general direction of Ft. Collins, Colorado. 2) Wait overnight for signal. 3) Be sure the atomic clock is at least 6 feet (2 meters) from any electrical devices, i.e. TV sets, computers, or other radio controlled clocks. 4) Remove batteries for five minutes, reinsert and leave the unit alone overnight without pressing any keys.
Problem:	Hour is incorrect (minute and date are correct).
Solution:	1) Be sure the correct time zone and daylight saving time are selected.
Problem:	"OFL" appears in the indoor temperature section of the LCD
Solution:	<ol style="list-style-type: none"> 1) Move the atomic clock to an area with warmer or cooler surrounding temperature. Current surrounding temperatures are outside measuring range.
Problem:	"---" appears in the outdoor temperature section of the LCD.
Solution:	<ol style="list-style-type: none"> 1) Remove the batteries of both units for one minute, then reinsert them again. Make sure the batteries are new and fresh. 2) Move the atomic clock closer to the transmitter or place the transmitter closer to the atomic clock. Make sure the clock is at a receivable range from the transmitter. 3) Move the units to another location. Interferences from other electrical devices operating on the same signal frequency (433MHz) may prevent correct signal transmission and reception.
Problem:	"OFL" appears in the outdoor temperature section of the LCD.
Solution:	<ol style="list-style-type: none"> 1) Wait until the current surrounding temperature cools down or increases. Current temperature is outside of the measuring range of the transmitter. The outdoor temperature will be displayed again once the current surrounding temperature is within the range of the transmitter.

CARE AND MAINTENANCE:

- Avoid placing the units in areas prone to vibration and shock as these may cause damage.
- Avoid areas where the units can be exposed to sudden changes in temperature, i.e. direct sunlight, extreme cold and wet/moist conditions as these will lead to rapid changes which reduces the accuracy of readings.
- When cleaning the LCD and casing, use a soft damp cloth only. Do not use solvents or scouring agents.
- Do not submerge the units into water.
- Immediately remove all low powered batteries to avoid leakage and damage. Replace only with new batteries of the recommended size.
- Do not make any repairs to the units. Please return it to the original point of purchase. Opening and tampering with the units may invalidate the warranty.

SPECIFICATIONS:

Temperature measuring range

Indoor: +14.1°F to +99.8°F with 0.2°F resolution
-9.9°C to +37.6°C with 0.1°C resolution
("OFL" displayed if outside this range)

Outdoor : -21.8°F to +157.8°F with 0.2°F resolution
-29.9°C to +69.9°C with 0.1°C resolution
("OFL" displayed if outside this range)

Temperature checking interval

Indoor: every 10 seconds

Outdoor: every 5 minutes

Humidity measuring range

Indoor: 1-99%

Transmission distance: maximum 330 feet (100 meters) in open field

Power source (Alkaline batteries recommended)

Atomic clock : 3 x AA, 1.5V batteries

Transmitter: 2 x AA, 1.5V batteries

Battery life: about 12 months

Dimensions (H x W x D)

Atomic clock: 11.75" x 12" x 1.25" / 299 x 305 x 32 mm

Transmitter: 5.04" x 1.57" x 0.9" / 128 x 40 x 23 mm

LIABILITY DISCLAIMER:

- The manufacturer and supplier cannot accept any responsibility for any incorrect readings and any consequences that occur should an inaccurate reading take place.
- This product is only designed for use in the home or office.
- This product is not to be used for medical purposes or for public information.
- The specifications of this product may change without prior notice.
- This product is not a toy. Keep out of the reach of children.
- No part of this manual may be reproduced without written authorization of the manufacturer.

BATTERIES CHANGE:

For best performance, batteries should be replaced at least once a year to maintain the best running accuracy. Ensure that the batteries used are new and the correct size.



Please help in the preservation of the environment and return used batteries to an authorized depot.

WARRANTY INFORMATION

La Crosse Technology, Ltd provides a 1-year limited warranty on this product against manufacturing defects in materials and workmanship.

This limited warranty begins on the original date of purchase, is valid only on products purchased and used in North America and only to the original purchaser of this product. To receive warranty service, the purchaser must contact La Crosse Technology, Ltd for problem determination and service procedures. Warranty service can only be performed by a La Crosse Technology, Ltd authorized service center. The original dated bill of sale must be presented upon request as proof of purchase to La Crosse Technology, Ltd or La Crosse Technology, Ltd's authorized service center.

La Crosse Technology, Ltd will repair or replace this product, at our option and at no charge as stipulated herein, with new or reconditioned parts or products if found to be defective during the limited warranty period specified above. All replaced parts and products become the property of La Crosse Technology, Ltd and must be returned to La Crosse Technology, Ltd. Replacement parts and products assume the remaining original warranty, or ninety (90) days, whichever is longer. La Crosse Technology, Ltd will pay all expenses for labor and materials for all repairs covered by this warranty. If necessary repairs are not covered by this warranty, or if a product is

examined which is not in need or repair, you will be charged for the repairs or examination. The owner must pay any shipping charges incurred in getting your La Crosse Technology, Ltd product to a La Crosse Technology, Ltd authorized service center. La Crosse Technology, Ltd will pay reasonable return shipping charges to the owner of the product.

Your La Crosse Technology, Ltd warranty covers all defects in material and workmanship with the following specified exceptions: (1) damage caused by accident, unreasonable use or neglect (including the lack of reasonable and necessary maintenance); (2) damage occurring during shipment (claims must be presented to the carrier); (3) damage to, or deterioration of, any accessory or decorative surface; (4) damage resulting from failure to follow instructions contained in your owner's manual; (5) damage resulting from the performance of repairs or alterations by someone other than an authorized La Crosse Technology, Ltd authorized service center; (6) units used for other than home use (7) applications and uses that this product was not intended or (8) the products inability to receive a signal due to any source of interference.. This warranty covers only actual defects within the product itself, and does not cover the cost of installation or removal from a fixed installation, normal set-up or adjustments, claims based on misrepresentation by the seller or performance variations resulting from installation-related circumstances.

LA CROSSE TECHNOLOGY, LTD WILL NOT ASSUME LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, PUNITIVE, OR OTHER SIMILAR DAMAGES ASSOCIATED WITH THE OPERATION OR MALFUNCTION OF THIS PRODUCT. THIS PRODUCT IS NOT TO BE USED FOR MEDICAL PURPOSES OR FOR PUBLIC INFORMATION. THIS PRODUCT IS NOT A TOY. KEEP OUT OF CHILDREN'S REACH.

This warranty gives you specific legal rights. You may also have other rights specific to your State. Some States do not allow the exclusion of consequential or incidental damages therefore the above exclusion of limitation may not apply to you.

For warranty work, technical support, or information contact:

La Crosse Technology, Ltd
190 Main Street
La Crescent, MN 55947
Phone: 507.895.7095
Fax: 507.895.2820

e-mail:
support@lacrossetechnology.com
warranty work)

sales@lacrossetechnology.com
(information on other products)

web:
www.lacrossetechnology.com

Questions ? Please see instruction video at
www.lacrossetechnology.info/8248

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